Date:

30 May 2006

To:

Fluor Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project:

200-UW-1 Operable Unit Clay Pipe Analysis.

Subject: Radiochemistry - Data Package No. W04900-ST

#### INTRODUCTION

This memo presents the results of data validation on Data Package No. W04900 prepared by Severn Trent (ST). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
B1J2T9	4/11/06_	Solid	С	See note 1
B1J2V0	4/11/06	Solid_	C	See note 1
B1J2V1	4/11/06	Solid	_ C	See note 1

<sup>1 -</sup> Selenium-79 by LSC.

Data validation was conducted in accordance with the FHI validation statement of work and the Sampling and Analysis Plan for Support Activities to the 200-UW-1 Operable Unit, DOE/RL-2005-75, Rev. O. Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

#### DATA QUALITY OBJECTIVES

#### · Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.



#### · Laboratory (Method) Blanks

#### Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

#### Field Blanks

One field blank (B1J2T9) was submitted for analysis. No analytes were detected in the field blank.

#### Accuracy

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is either 65-135% or 70-130%, depending on the analyte. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of an LCS or matrix spike analysis, all selenium-79 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

#### · Precision

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection limit (CRDL) and the RPD is less than  $\pm$ 1-35 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

#### Field Duplicate Samples

One set of field duplicates (B1J2V0/B1J2V1) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory blanks. All field duplicate results were acceptable.

#### Detection Levels

Reported analytical detection levels are compared against the required target quanitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. All analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

#### · Completeness

Data package SDG No. W04900 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

#### **MAJOR DEFICIENCIES**

None found.

#### MINOR DEFICIENCIES

Due to the lack of an LCS or matrix spike analysis, all selenium-79 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the FHI statement of work, the data may be usable for decision-making purposes. All other validated results are

considered accurate within the standard error associated with the methods.

All analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

#### **REFERENCES**

FHI, Contract #20266, Validation Statement of Work, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2005-75, Rev. 0, Sampling and Analysis Plan for Support Activities to the 200-UW-1 Operable Unit, December 2005.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the FHI statement of work are as follows:

- Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

# Appendix 2 Summary of Data Qualification

## RADIOCHEMISTRY DATA QUALIFICATION SUMMARY\*

SDG: W04900	REVIEWER:	Project: 200-UW-1	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Selenium-79	J	All	No MS or LCS analysis

<sup>\* -</sup> The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Qualified Data Summary and Annotated Laboratory Reports

Project: FLUOR-HAN	lFORD						
Laboratory: ST				1			
Case	SDG:	W04900					
Sample Number		B1J2T9		B1J2V0		B1J2V1	
Remarks		E. Blank				Duplicate	
Sample Date		4/11/06		4/11/06		4/11/06	
Radiochemistry	RTQL	Result	Q	Result	Q	Result	Q
Selenium-79	0.1	0.120	UJ	0.177	UĴ	1.80	UJ

FORM I

**SAMPLE RESULTS** 

Lab Name:

STL Richland

SDG:

W04900

Collection Date: 4/11/2006 11:20:00 AM

Date: 17-May-06

Lot-Sample No.: J6D140246-1

Report No.:

32101

Received Date:

4/12/2006 3:35:00 PM SOLID SOIL

Client Sample ID: B1J2T9

COC No.:

R06-008-002

Matrix:

Ordered by Client Samole ID, Batch No.

Parameter	Result Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC   MDA, Action Lev	Rpt Unit, Le	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6107201	SE79_SEP_IE_LSC		Work Order:	AA18HACH	Report	DB ID: 9H3A	.H810				
SE-79	1.20E-01 U J	1.0E+00	1.2E+00	2.44E+00 p	CVg	81%	0.05	5/10/06 10:50 p		1.0	LSC3
					1.17E+00	1.00E+01	0.19			G	

124/06

## FORM I

## SAMPLE RESULTS

Lab Name:

STL Richland

SDG:

W04900

Received Date:

Collection Date: 4/11/2006 2:00:00 PM 4/12/2006 3:35:00 PM

Lot-Sample No.: J6D140246-2

Report No.:

32101

Matrix:

SOIL

SOLID

Date: 17-May-08

Client Sample ID: B1J2V0

COC No.: R06-008-002

Ordered by Client Sample ID, Batch No.

Parameter	Result Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Uolt,	Yleid CRDL(RL)	Rst/MDC, Rst/TntUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6107201	SE79_SEP_IE_LSC		Work Order:	H3A5P1AA	Repor	t DB ID: 9H3A	.5P10				
SE-79	1.77E-01 UJ	2.1E+00	2.6E+00	5.16E+00	pCi/g	76%	0.03	5/11/08 12:15 a		0.5042	LSC3
					2.47E+00	1.00E+01	0.14			G	

No. of Results: 1

Comments:

V4.15.0 A97

#### FORM I

#### **SAMPLE RESULTS**

Lab Name:

STL Richland

SDG:

W04900

Collection Date: 4/11/2006 2:00:00 PM

Lot-Sample No.: J6D140246-3

Report No.:

32101

Received Date:

4/12/2006 3:35:00 PM SOIL

Client Sample ID: B1J2V1

COC No.:

R06-008-002

Matrix:

SOLID

Date: 17-May-06

Ordered by Client Sample ID. Batch No.

Parameter	Result Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, Le	Vield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6107201	SE79_SEP_IE_LSC		Work Order:	H3A5T1AA	Repor	DBID: 9H3A	5110				
SE-79	1.80E+00 U J	2.1E+00	2.6E+00	4.90E+00 p	·Ci/g	79%	0.37	5/11/06 12:58 a		0.5061	LSC3
					2,35E+00	1.00E+01	(1.4)			G	
	~ <del></del>										

No. of Results: 1 Comments:

1/29/04

Laboratory Narrative and Chain-of-Custody Documentation

## Certificate of Analysis

Fluor Hanford P.O. Box 1000, T6-03 Richland, WA 99352

May 17, 2006

Attention: John Trechter

SAF Number : R06-008
Date SDG Closed : April 12, 2006
Number of Samples : Three (3)
Sample Type : Other Solid
SDG Number : W04900

Data Deliverable : 15 / 15-Day Summary

## **CASE NARRATIVE**

#### I. Introduction

On April 12, 2006, three other solid samples were received at STL Richland (STLR) for radiochemical analysis. Upon receipt, the samples were assigned to lot J6D140246 and assigned the following laboratory ID number to correspond with the Fluor Hanford (FH) specific ID:

FH ID#	STLR ID#	<b>MATRIX</b>	DATE OF RECEIPT
B1J2T9	Н3АН8	OTHER SOLID	4/12/06
B1J2 <b>V</b> 0	H3A5P	OTHER SOLID	4/12/06
B1J2VI	H3A5T	OTHER SOLID	4/12/06

#### II. Sample Receipt

The samples were received in good condition and no anomalies were noted during check-in.

#### III. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

Fluor Hanford May 17, 2006

The requested analyses were:

# Liquid Scintillation Counting Sclenium-79 by method RICH-RC-5043

#### IV. Quality Control

The analytical results for each analysis performed includes a minimum of one laboratory control sample (LCS), one method (reagent) blank, and one duplicate sample analysis. Any exceptions have been noted in the "Comments" section.

QC and sample results are reported in the same units.

#### V. Comments

#### **Gas Proportional Counting**

Selemium-79 by method RICH-RC-5043

There is currently not an available standard for Selenium 79 and an LCS was not analyzed. The batch blank, sample and sample duplicate (B1J2T9) results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager, or a designee as verified by the following signature.

Reviewed and approved:

Sandra Seger Project Manager

DISPOSITION

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Data Validation Supporting Documentation

# APPENDIX A RADIOCHEMICAL DATA VALIDATION CHECKLIST

		- <del></del>		<del>,                                     </del>	
VALIDATION LEVEL:	A	В	( c)	D	E
	200-66-1	<del></del>	DATA PACKAC	BE: WOY9	0()
VALIDATOR:	TLT	LAB: ST		DATE: 5/2	s/cx
		ANALVODO	SDG: PERFORMED	WOY900	
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	(SE-79)	<u> </u>	
SAMPLES/MAT		R MANG	8 . 7 2		
121	J2T9	B 17210	BIJSVI		
		<del></del>			
				Solid	591
1. Completenes	SS				N. A
Technical verifi	cation forms pr	esent?		Ye	NO N/A
	canon round pr				
Comments:					
2 Initial Calibr	ration (Levels T	o, E)			N/A
z. milai Canoi	ation (Ecvels E	, L)	••••••		
Instruments/det	ectors calibrate	d?		•••••	Yes No N/A
Initial calibration	n acceptable?		······································		Yes No N/A
Standards NIST	traceable?			•••••	Yes No N/A
Standards Expir	ed?			•••••	Yes No N/A
Calculation che	ck acceptable?.			••••••	Yes No N/A
Comments:	•				
		<del></del>			

3. Continuing Calibration (Levels D, E)	TO N/A
Calibration checked within required frequency?	Yes No N/A
Calibration check acceptable?	Yes No N/A
Calibration check standards traceable?	Yes No N/A
Calibration check standards expired?	Yes No N/A
Calculation check acceptable?	Yes No N/A
Comments:	
4. Background Counts (Levels D, E)	N/A
Background Counts checked within required frequency?	•
Background Counts acceptable?	Yes No N/A
Calculation check acceptable?	Yes No N/A
Comments:	

5. Blanks (Levels B, C, D, E)	N/A
Method blank analyzed within required frequency?	Yes No NA
Method blank results acceptable?	
Analytes detected in method blank?	
Field blank(s) analyzed?	~ · · · · · · · · · · · · · · · · · · ·
Field blank results acceptable?	
Analytes detected in field blank(s)?	
Transcription/Calculation Errors? (Levels D, E)	
Comments:	
6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E)	\( \square\) \( \square\) \( \square\) \( \square\)
LCS /BSS analyzed within required frequency?	Yes No N/A
LCS/BSS recoveries acceptable?	Yes No(N/A'
LCS/BSS traceable? (Levels D,E)	Yes No (V/A)
LCS/BSS expired? (Levels D,E)	Yes No (N/A)
LCS/BSS levels correct? (Levels D,E)	Yes No (1/)
Transcription/Calculation Errors? (Levels D, E)	Yes No XX
Comments: NO LCS - Jall	$\overline{}$
7. Chemical Carrier Recovery (Levels C, D, E)	N/A
Chemical carrier added?	Yes No N/A
Chemical recovery acceptable?	Yes No N/A
Chemical carrier traceable? (Levels D, E)	

Chemical carrier expired? (Levels D, E)	Yes	No	N/A
Transcription/Calculation errors? (Levels D, E)	Yes	No	N/A
Comments:			
8. Tracer Recovery (Levels C, D, E)		LJ	N/Δ
Tracer added?	(.Yes	No	N/A
Tracer recovery acceptable?	Yes	No	N/A
Tracer traceable? (Levels D, E)	Yes	Nq	NA
Tracer expired? (Levels D, E)	Yes	No	
Transcription/Calculation errors? (Levels D, E)	Yes	No	N/A)
Comments: buter Thatla			
5/01			
	_		
9. Matrix Spikes (Levels C, D, E)		□	N/A
Matrix spike analyzed?	Yes	Nol	N/A
Spike recoveries acceptable?	Yes	No	(N/À
Spike source traceable? (Levels D, E)			7
Spike source expired? Levels D, E)			$\smile$
Transcription/Calculation Errors? (Levels D, E)			$\searrow$
Comments: NUMS-Jal			
V ( )			

10. Duplicates (Levels C, D, E)	🗆 N/A
Duplicates Analyzed at required frequency?	Yes No N/A
RPD Values Acceptable?	
Transcription/Calculation Errors? (Levels D, E)	Yes No N/A
Comments:	
11. Field QC Samples (Levels C, D E)	D N/A
Field duplicate sample(s) analyzed?	Yet No MA
Field duplicate RPD values acceptable?	
Field split sample(s) analyzed?	Υes(No)N/Λ
Field split RPD values acceptable?	Yes No NA
Performance audit sample(s) analyzed?	Yes(No N/A
Performance audit sample results acceptable?	Yes No (V/M
Comments: A	o Field Offen
	NO FS OF PAS
12. Holding Times (All levels)	
Are sample holding times acceptable?	
Comments:	

13. Results and Detection Limits (All Levels )	🗆 N/A
Results reported for all required sample analyses?  Results supported in raw data?(Levels D, E)	No N/A
MDA la most required detection limits?	No WA
MDA's meet required detection limits? Yes  Transcription/calculation errors? (Levels D, E)	NO N/A
Comments: Yes	

Additional Documentation Requested by Client

#### FORM II

Date: 17-May-06

## **DUPLICATE RESULTS**

Lab Name:

STL Richland

SDG:

W04900

Collection Date: 4/11/2006 11:20:00 AM

Lot-Sample No.: J6D140246-1

Report No.: 32101

Received Date:

4/12/2006 3:35:00 PM

Client Sample ID: B1J2T9 DUP

COC No.:

R06-008-002

Matrix:

SOIL

SOLID

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert( 2 s)	MDC MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Allquot Size	Primary Detector
Batch: 6107201	SE79_SEP_IE_LSC			Work Order: H3AH81AC			DB ID: H3A	H81CR	Orig Sa DB ID: 9H	3AH810		
SE-79	2.05E-01	U	1.0E+00	1.2E+00	2.40E+00	pCi/g	82%	0.09	5/10/06 11:33 p		1.0	LSC3
	1.20E-01	U	RPD	52.4		1.00E+01		0.34			G	<b></b>

No. of Results: 1

Comments:

# FORM II

Date: 17-May-06

**BLANK RESULTS** 

Lab Name: STL Richland

SDG:

W04900

Matrix: SOIL

Report No.: 32101

Parameter	Result Qual	Count Error ( 2 s)	Total Uncert( 2 s)	MDC{MDA	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Primary Detector
Batch: 6107201	SE79_SEP_IE_LSC		Work Order:	H3EWR1AA	Report	DB ID: H3	EWR1AB				
SE-79 5.	5.80E-01 U	2.2E+00	2.7E+00	5.31E+00	pCi/g	37%	0.11	5/11/06 01:40 a		1.0	LSC3
				2.55E+00	1.00E+01		0.43			G	